



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,376	01/15/2004	Xinliang David Li	200313024-1	5436
22879 7590 02/03/2010 HEWLETT-PACKARD COMPANY Intellectual Property Administration 3404 E. Harmony Road Mail Stop 35 FORT COLLINS, CO 80528				
EXAMINER				
KANG, INSUN				
ART UNIT		PAPER NUMBER		
2193				
NOTIFICATION DATE		DELIVERY MODE		
02/03/2010		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

JERRY.SHORMA@HP.COM

ipa.mail@hp.com

laura.m.clark@hp.com

Office Action Summary

Application No.

10/758,376

Applicant(s)

LI ET AL.

Examiner

INSUN KANG

Art Unit

2193

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 November 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 4-18 and 20-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-18 and 20-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/06)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This action is in response to the Appeal Brief filed on 11/6/2009.
2. In view of the appeal brief filed on 11/6/2009, prosecution is hereby reopened. New grounds of rejection are introduced below. To avoid abandonment of the application, appellant must exercise one of the following two options:
 - (1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or, (2) request reinstatement of the appeal. If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted.

The previous office action has been withdrawn. Claims 1, 2, 4-18, and 20-35 are pending in the application.

Specification

3. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The term, "computer-readable storage medium" in claims 31-35 is not defined in the specification. The meaning of every term used in any of the claims should be apparent from the descriptive portion of the specification with clear disclosure as to its import. The claim or claims must conform to the invention as set forth in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description. See MPEP § 2111.01 and § 2173.05(a), 608.01(o) [R-3], 608.01(i),

1302.01, and 37 CFR 1.75 and 1.58(a). The appropriate term that is supported in the disclosure needs to be used in the claims.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 22 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 22 recites the limitation "the per-procedure summary data" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Per claim 23, it is rejected based on the dependency on the parent claim 22.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained if the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 2, 4-18, 20, 21, 24-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dehnert et al. (US Patent 6,059,839) hereafter Dehnert, in view of Goebel (US 6,289,505).

Per claim 1:

Dehnert discloses:

-accessing a first file including source code therein (i.e. col. 3:65-67;col.5:15-20);

accessing a second file including object code therein and further including object file summary information (i.e. col. 6:13-17)

- and further including object file summary information; and generating the executable binary file from at least the first and second files (i.e. col. 8:60-65)

-wherein the object file summary information includes a summary intermediate representation (SIR) (i.e. col. 6:14-25)

Dehnert does not explicitly teach that the object file summary information includes an extension to a linker symbol table. Goebel teaches such an extension to a linker symbol table was known in the pertinent art, at the time applicant's invention was made, to correctly relocate addresses of all symbols that are referenced by a linker (i.e. col. 7 lines 8-21). It would have been obvious for one having ordinary skill in the art to modify Dehnert's disclosed system to incorporate the teachings of Goebel. The modification would be obvious because one having ordinary skill in the art would be motivated to relocate addresses in the IPA summary table for linking by updating the global symbol table with correct values.

Dehnert further discloses: wherein the object file summary information is used in optimizing the executable binary file generated (i.e. col. 8:60-67).

Per claim 2:

Dehnert further discloses:

- disambiguating memory accesses otherwise considered aliased using the object file summary information (i.e. col. 6 lines 35-49).

Per claim 4:

Dehnert further discloses:

- wherein the extension to the linker symbol table includes a flag indicating whether a procedure exposes a memory address by storing the address in a location accessible outside the procedure (i.e. col. 5:49-52; col. 6:59-67).

Per claim 5:

Dehnert further discloses:

- wherein the SIR includes a summary symbol table (i.e. col. 6:15-17).

Per claim 6:

Dehnert further discloses:

- wherein the summary symbol table includes global and static symbols accessed in the procedure, formal parameters of the procedure, return location for the procedure, and other procedures called by the procedure (i.e. col. 5:53-67).

Per claim 7:

Dehnert further discloses:

- wherein a symbol is referenced in the summary symbol table in using an associated summary symbol identifier (SYMID) (i.e. col. 6:15-17).

Per claim 8:

Dehnert further discloses:

- wherein a symbol entry includes a linker identifier (LI_ID) of the entry from a linker symbol table (i.e. col. 6:15-17).

Per claim 9:

Dehnert teaches that the SIR uses an operator for memory referencing (i.e. col. 8:1-12).

Per claim 10:

Dehnert further discloses:

- wherein the SIR uses an operator to adjust the address expression by an offset (i.e. col. 7:50-61).

Per claim 11:

Dehnert further discloses:

- wherein the SIR uses an operator to take an address of a function or variable (i.e. col. 8:27-36).

Per claim 12:

Dehnert further discloses:

- wherein the SIR uses an operator to merge pointer values from different control flow paths (i.e. col. 7:50-61).

Per claim 13:

Dehnert teaches: the SIR uses an operator to represent direct procedure calls (i.e. col. 8:48-55).

Per claim 14:

Dehnert teaches that the SIR uses an operator to represent indirect procedure calls (i.e. col. 8:48-55).

Per claim 15:

Dehnert does not explicitly teach the SIR uses a no-operation type operator to discard values. Goebel teaches such a nop instruction was known in the pertinent art, at the time applicant's invention was made, to replace with any removed or redundant code (i.e. col. 8 lines 5-28). It would have been obvious for one having ordinary skill in the art to modify Dehnert's disclosed system to incorporate the teachings of Goebel. The modification would be obvious because one having ordinary skill in the art would be motivated to replace any removed instructions for timing purposes.

Per claim 16:

Dehnert further discloses:

- wherein the SIR includes a control data structure comprising a link field for each procedure that points to an SIR block of a next procedure (i.e. col. 8:37-47).

Per claim 17:

Dehnert further discloses:

- the SIR includes a control data structure comprising a table having links to an SIR block for each procedure (i.e. col. 7:50-61).

Per claim 18:

Dehnert further discloses:

- determining variables modified by and referenced by function calls in the object code using the object file summary information (i.e. col. 7:25-49).

Per claim 20:

Dehnert further discloses:

- wherein the extension to the linker symbol table includes a first flag indicative of whether a procedure modifies non-local variables and a second flag indicative of whether the procedure references non-local variables (i.e. col. 8:12-36).

Per claim 21:

Dehnert further discloses:

- wherein the extension to the linker symbol table includes a second flag indicative of whether the procedure modifies global/static variables excluding callees and a third flag indicative of whether the procedure references non-local variables excluding callees (i.e. col. 8:12-36).

Per claim 24:

Dehnert further discloses: the second file comprises a load module that is a shared library of procedures (i.e. col. 7:16-25).

Per claim 25:

Dehnert further discloses:

- wherein multiple files including object code are accessed and used in compiling the program (i.e. col. 7:16-25).

Per claims 26-28, they are the system versions of claims 1-2 and 18 respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1-2 and 18 above.

Per claim 29:

Goebel further discloses:

- the translator comprises: a compiler configured to translate source files into intermediate files; and a linker configured to access the object file summary information

and communicate information to the compiler relevant to optimizing compilation of the program (i.e. col. 7:10-22, 60-67).

Per claim 30:

Dehnert and Goebel further discloses:

- a feedback provider that provides a communications interface between the compiler and the linker (i.e. Dehnert, col. 7:1-25; Goebel, col. 7:10-22).

Per claims 31-34, they are the medium versions of claims 1, 3, 5, 6, and 9-15 respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1, 3, 5, 6, and 9-15 above.

7. Claims 22, 23, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dehnert et al. (US Patent 6,059,839) hereafter Dehnert, in view of Goebel (US 6,289,505), and further in view of Lohmann (US Patent 5, 826,087).

Per claim 22:

Dehnert and Goebel do not explicitly teach that the per-procedure summary data comprises a linked list of entries corresponding to symbols directly mod-refined in a procedure. Lohmann teaches using a linked list as data storage was known in the pertinent art, at the time applicant's invention was made, to provide efficient memory usage (i.e. col. 5 lines 15-25). It would have been obvious for one having ordinary skill in the art to modify Dehnert and Goebel's

disclosed system to incorporate the teachings of Lohmann. The modification would be obvious because one having ordinary skill in the art would be motivated to dynamically adjust memory space as a linked list grows and shrinks.

Per claim 23:

Dehnert further discloses:

- wherein each entry comprises a linker identifier of a corresponding symbol and flags indicative of whether that symbol is modified or referenced (i.e. col. 7:36-49).

Per claim 35:

It is the object file version of claim 22, respectively, and is rejected for the same reasons set forth in connection with the rejection of claim 22 above.

Response to Arguments

8. Applicant's arguments with respect to claims 1, 2, 4-18, and 20-35 have been considered but are moot in view of the new ground(s) of rejection.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to INSUN KANG whose telephone number is (571)272-3724. The examiner can normally be reached on M-R 7:30-6 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lewis A. Bullock, Jr. can be reached on 571-272-3759. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Insun Kang/
Primary Examiner, Art Unit 2193

/Lewis A. Bullock, Jr./
Supervisory Patent Examiner, Art Unit 2193